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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/524,610

08/11/2005

Franz Laermer

10191/4116

9981

26646 7590 08/02/2010

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EXAMINER

HO, HOANG QUAN TRAN

ART UNIT

PAPER NUMBER

2818

MAIL DATE

DELIVERY MODE

08/02/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/524,610	<b>Applicant(s)</b> LAERMER ET AL.	
	<b>Examiner</b> Hoang-Quan T. Ho	<b>Art Unit</b> 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-17, 19-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 is/are allowed.
- 6) ☒ Claim(s) 16, 17, 20-23 and 25-28 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/07/2010, 05/27/2010</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment to the claims, filed on May 10, 2010, is acknowledged.  
Entry of amendment is accepted and made of record.

### ***Response to Arguments/Remarks***

Applicant's response filed on April 7, 2010 is acknowledged and is answered as follows.

Applicant's remarks, see pg. 5, with respect to the objection of claim 22 has been fully considered and are persuasive. Therefore, the objection has been rendered moot.

Applicant's arguments with respect to the rejections of claims 16 and 20 – 23 under 35 U.S.C. § 102 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, see pgs. 6 – 7, with respect to the rejections of claims 16 and 23 under 35 U.S.C. § 103 have been fully considered but they are not persuasive in view of the following reasons. ¶11 of Hong clearly discloses that the SOG contains carbon material, which makes it an organic compound.

Applicant's arguments, see pgs. 8 – 9, with respect to the rejections of claims 16 and 24 under 35 U.S.C. § 103 have been fully considered and are persuasive.  
Therefore, the rejections have been rendered moot.

***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on April 7, 2010 and May 27, 2010 are being considered by the examiner.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 16 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong *et al.* (U.S. Pat. App. Pub. No. 2003/0013272 A1), hereinafter as Hong.

Regarding claim 16, figs. 1 – 2 of Hong discloses a layer system, comprising:

an etched layer (ref. 10 having ref. 30; ¶6), whereby the etched layer is a silicon layer (¶6 discloses a semiconductor substrate, but does not specify the material thereof. It is well known in the art that silicon is a known material to be used as a semiconductor substrate; see M.P.E.P. § 2144.07); and

a passivation layer (refs. 40 and 50) applied at least regionally to a surface of the silicon layer (as seen in fig. 2), wherein:

the passivation layer includes a first, at least largely, inorganic partial layer (ref. 40; ¶6) and a second partial layer (ref. 50), and

the second partial layer is made of an organic compound (¶11), wherein the organic compound includes a silane corresponding to one of an organic fluorine silane, an organic fluorochlorine silane, and a siloxane (¶11, the SOG contains carbon material, which makes it an organic compound).

Regarding claim 23, Hong discloses the layer system as recited in Claim 16, wherein the first partial layer is directly applied one of (a) to the silicon layer (as seen in

fig. 2) and (b) on a layer of silicon oxide (on the bottom of ref. 70) situated on the silicon layer (as seen in fig. 2).

Claims 16 – 17 and 20 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwansnick *et al.* (U.S. Pat. No. 5, 233,181), hereinafter as Kwansnick, and further in view of Tetsuya Homma (Fluorinated interlayer dielectric films in ULSI multilevel interconnections), hereinafter as Homma.

Regarding claim 16, fig. of Kwansnick discloses a layer system, comprising:

an etched layer, whereby the etched layer is a silicon layer (ref. 120; col. 4, lines 24 – 42); and

a passivation layer (ref. 130) applied at least regionally to a surface of the silicon layer (ref. 122; as seen in fig.), wherein:

the passivation layer includes a first, at least largely, inorganic partial layer (ref. 132) and a second partial layer (ref. 134), and

the second partial layer is made of an organic compound (col. 5, lines 34 – 36).

Kwansnick discloses the organic compound used is a polyimide (col. 5, lines 34 – 36) for reasonably smooth and planarizing effect (col. 5, lines 28 – 32). However, Kwansnick may not disclose the following limitation whereas Homma discloses that it is known in the art to provide wherein the organic compound includes a silane corresponding to one of an organic fluorine silane, an organic fluorochlorine silane, and a siloxane (abstract, Section 1. Introduction, Section 2.1.2. Organic films; fluorinated

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polyimide siloxane). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the invention of Kwansnick with the organic compound includes a silane corresponding to one of an organic fluorine silane, an organic fluorochlorine silane, and a siloxane, in order to provide a high planarization capability (abstract of Homma).

Regarding claim 17, Kwansnick and Homma disclose the layer system as recited in Claim 16, Homma discloses wherein the organic compound contains a halogen (fluorine; abstract of Homma).

Regarding claim 20, Kwansnick and Homma disclose the layer system as recited in Claim 16, Kwansnick discloses wherein the first partial layer is at least largely composed of an oxide layer including having a silicon oxide (abstract, lines 6 – 7).

Regarding claim 21, Kwansnick and Homma disclose the layer system as recited in Claim 16, Kwansnick discloses wherein the first partial layer has a thickness of 1 nm to 100 nm (col. 4, lines 53 – 55).

Regarding claim 22, Kwansnick and Homma disclose the layer system as recited in Claim 16, Kwansnick discloses wherein the first partial layer has a thickness of 1nm to 20 nm (col. 4, lines 53 – 55).

Regarding claim 23, Kwansnick and Homma disclose the layer system as recited in Claim 16, Kwansnick discloses wherein the first partial layer is directly applied one of (a) to the silicon layer (region of ref. 122, as seen in fig.) and (b) on a layer of silicon oxide situated on the silicon layer.

Claims 25 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwansnick and Homma as applied to claim 16 above.

Regarding claim 25, Kwansnick and Homma disclose the layer system as recited in Claim 16, but Kwansnick and Homma may not disclose the following limitation whereas one of ordinary skill in the art would have been capable of providing wherein the second partial layer has a thickness of 0.5 nm to 30 nm. In view of M.P.E.P. § 2144.05(I), it states:

*"In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of "50 to 100 Angstroms" considered *prima facie* obvious in view of prior art reference teaching that "for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms]." The court stated that "by stating that suitable protection' is provided if the protective layer is about' 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant's] claimed range."). Similarly, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties."

Col. 5, lines 34 – 44 of Kwansnick discloses an example that the organic dielectric layer 134 having a thickness of between about 0.5 micron and 2.5 microns, the thickness selected to provide the desirable passivation layer characteristics,



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including providing sufficient separation between the top contact layer to limit the capacitance. *Ergo*, while Kwansnick expresses a preference of an illustrated thickness, at the same time it provides the motivation for one of ordinary skill in the art to focus on thickness levels at the lower end of Kwansnick suitable range and to explore thickness levels below that range to provide desirable passivation layer characteristics, including providing sufficient separation between the top contact layer to limit the capacitance, which may arrive at a thickness of 0.5 nm to 30 nm.

Regarding claim 26, Kwansnick and Homma disclose the layer system as recited in Claim 16, but Kwansnick and Homma may not disclose the following limitation whereas one of ordinary skill in the art would have been capable of providing wherein the second partial layer has a thickness of 5 nm to 20 nm. In view of M.P.E.P. § 2144.05(I), it states:

*"In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of "50 to 100 Angstroms" considered prima facie obvious in view of prior art reference teaching that "for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms]." The court stated that "by stating that suitable protection' is provided if the protective layer is about' 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant's] claimed range."). Similarly, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties."

Col. 5, lines 34 – 44 of Kwansnick discloses an example that the organic dielectric layer 134 having a thickness of between about 0.5 micron and 2.5 microns, the thickness selected to provide the desirable passivation layer characteristics,

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including providing sufficient separation between the top contact layer to limit the capacitance. *Ergo*, while Kwansnick expresses a preference of an illustrated thickness, at the same time it provides the motivation for one of ordinary skill in the art to focus on thickness levels at the lower end of Kwansnick suitable range and to explore thickness levels below that range to provide desirable passivation layer characteristics, including providing sufficient separation between the top contact layer to limit the capacitance, which may arrive at a thickness of 5 nm to 20 nm.

Claims 27 – 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwansnick and Homma as applied to claim 16 above, and further in view of Laermer *et al.* (U.S. Pat. App. Pub. No. 2006/0108576 A1), hereinafter as Laermer.

Regarding claim 27, Kwansnick and Homma disclose the layer system as recited in Claim 16, but Kwansnick and Homma may not disclose the following limitation whereas one of ordinary skill in the art would have recognized wherein the passivation layer protects the silicon layer with respect to an etch attack by a gaseous halogen fluoride including one of  $\text{ClF}_3$  and  $\text{BrF}_3$ . ¶4 of Laermer discloses that it is known in the art that silicon oxide is capable of withstanding a chlorine trifluoride ( $\text{ClF}_3$ ) etch attack. Kwansnick discloses that the passivation layer (ref. 130) comprises a silicon oxide layer (ref. 132; abstract, lines 6 – 7). In view of M.P.E.P. § 2144.07, the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness.

Furthermore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In essence, apparatus claims cover what a device is, not what a device does. See M.P.E.P. § 2112.01 and § 2114.

Regarding claim 28, Kwansnick and Homma disclose the layer system as recited in Claim 16, but Kwansnick and Homma may not disclose the following limitation whereas one of ordinary skill in the art would have recognized wherein the passivation layer is free of micro-scale or nano-scale channels which are permeable for a gas including one of  $\text{ClF}_3$ ,  $\text{BrF}_3$  and a vapor. ¶4 of Laermer discloses that it is known in the art that silicon oxide is capable of withstanding a chlorine trifluoride ( $\text{ClF}_3$ ) etch attack. ¶10 of Laermer discloses that an etch attack, such as  $\text{ClF}_3$ , would cause undesirable micro-scale or nano-scale channels. *Ergo, inter alia*, silicon oxide withstanding a  $\text{ClF}_3$  etch attack would lead to the possibility of no micro-scale or nano-scale channels. Kwansnick discloses that the passivation layer (ref. 130) comprises a silicon oxide layer (ref. 132; abstract, lines 6 – 7). In view of M.P.E.P. § 2144.07, the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness.

Furthermore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to

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patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In essence, apparatus claims cover what a device is, not what a device does. See M.P.E.P. § 2112.01 and § 2114.

### ***Allowable Subject Matter***

Claim 19 is allowed.

Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The cited art, whether taken singularly or in combination, especially when all limitations are considered within the claimed specific combination, fails to teach or render obvious a layer system as recited in claims 19 and 24.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The disclosure of Toan Nguyen Nhu teaches that SOG (spin on glass) materials, such as siloxane SOG, is considered to be an organic compound. See pg. 8, section 1.3.2. Cited Homma *et al.* references disclose polyimide siloxane material.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoang-Quan T. Ho whose telephone number is (571)272-8711. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on 571-272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hoang-Quan T Ho/  
Examiner, Art Unit 2818  
July 26, 2010

/Andy Huynh/  
Primary Examiner, Art Unit 2818